

Application No.: 10/074,151
Docket No.: JCLA5041-CA2

REMARKS

Present Status of the Application

Applicants would like to thank Examiner for the careful review of this application. The Office Action allowed claims 4, 7, 9 and 11-13, but rejected claims 1, 2, 5, 6 and 10. Specifically, the Office Action rejected claims 5 and 6 under 35 U.S.C. 112, first paragraph, as containing new matter. The Office Action also rejected claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over Kondo (US-5,360,765) (hereinafter Kondo) in view of Barnes (US-5178,739) (hereinafter Barnes). In addition, the Office Action rejected claim 10 under 35 U.S.C. 101 as claiming the same invention as that of claim 1 of prior US 6,254,739 B1. Further. The Office Action also rejected claim 1 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4 of US 6,254,739 B1. Applicant has cancelled claim 10 and has amended specification and claim 1 to clarify the claim scope of the present invention. After entry of the foregoing amendments, claims 1-2, 4-7, 9, and 11-13 remain pending in the present application. Reconsideration and allowance of the application is respectfully requested.

Response To Disclosure Objection

Disclosure is objected because of some informalities: the serial number for the parent application is incorrect on page 1 beginning at line 4; also, the status of both the parent and grandparent applications needs updated. Appropriate correction is required.

Applicant has revised the serial number for the parent application on page 1 beginning at line 4. Withdrawal of the objection is respectfully requested.

Response To 35 U.S.C. 112 Rejection

Claims 5 and 6 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to responsibly convey to one possession of the claimed invention.

Applicant respectfully traverses the rejection.

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Regarding the present claim 5, the original claims 5 and 6 recite that "the first bias is about 250W to about 450W", and "the second bias is about 150W to about 300W". The condition that "the first bias is substantially higher than the second bias" is inherently included in the original disclosure. Therefore, it is not new matter.

Regarding the present claim 6, on page 8, lines 7-11, of the specification, it is described that "[A]s shown in Fig. 3A, step 450a is performed to deposit a conformal metal film 208 over the substrate 200 in an IMP chamber, PVD chamber, or the like. This deposition step 450a can be alternatively performed by a BDS technique, or by TiCl₄-based chemical vapor deposition (CVO)", which indicates dry cleaning and amorphizing the substrate surface and forming the metal film can be performed in different chambers. Therefore, it is not new matter.

Applicant has amended the specification to add the above phrases. Reconsideration and withdrawal of the rejection is respectfully requested.

Response To 35 U.S.C. 103 (e) Rejection

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over US-5,360,765 to Kondo in view of US-5,178,739 to Barnes.

Applicant has further amended claim 1.

Applicant respectfully submits that Kondo in view of Barnes is legally deficient for the purpose of rendering obvious claim 1 for at least the reason that the combination of Kondo and Barnes fails to disclose every claimed feature of the present invention as defined in claims 1 and 2. More specifically, both Kondo and Barnes fail to disclose "in situ depositing a titanium film on the amorphized silicon substrate by second using the same sputtering chamber, wherein the sputtering chamber is an ionized metal plasma (IMP) equipment unit" as recited in the amended claim 1.

The present invention as defined in claim 1 provides a silicon substrate. A sputtering step is performed to simultaneously dry clean and amorphize a silicon substrate surface in the sputtering chamber. Thereafter, a metal film, such as a titanium film is in situ deposited on the silicon substrate in the same sputtering chamber, so that the wafer throughput is improved. However, Kondo teaches, on Col. 4:33-41, the wafer is bombarded *in the station 13*, and, on

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Col. 4: 56-58, "Next, a wafer is transferred into the station (Ti film forming chamber) 15 to deposit a Ti film 7 on the silicon substrate 1". That is, the wafer must be transferred after performing the bombardment step, so that the bombardment step and the deposition step are not in situ performed. Therefore, Kondo and Barnes, which teaches the use of rf coil, either alone or in combination fails to teach "in situ depositing a titanium film on the amorphized silicon substrate by second using the same sputtering chamber, wherein the sputtering chamber is an ionized metal plasma (IMP) equipment unit"

For at least the reasons discussed above, Applicants submit that Kondo and Barnes do not render obvious the present invention as recited in claim 1 and claim 2. Applicants, therefore, respectfully request that the rejection of claim 1 and claim 2 under 35 U.S.C. 103(a) be withdrawn.

Response To Double Patenting Rejection

Claim 10 is rejected under 35 U.S.C. 101 as claiming the same invention as that of claim 1 of prior US-6,254,739 B1.

Applicant canceled claim 10. Thus, the rejection is moot.

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4 of US 6,254,739 B1.

Applicant respectfully asserts that claim 4 of US-6,254,739 B1 is legally deficient for the purpose of anticipating claim 1 for at least the reason that claim 4 of US-6,254,739 B1 fails to disclose every claimed feature of the present invention as defined in claim 1. More specifically, claim 4 of US-6,254,739 B1 fails to disclose "in situ depositing a titanium film on the amorphized silicon substrate by second using the same sputtering chamber, wherein the sputtering chamber is an ionized metal plasma (IMP) equipment unit" as recited in the amended claim 1.

The present invention as defined in claim 1 provides a silicon substrate. A sputtering step is performed to simultaneously dry clean and amorphize a silicon substrate surface in the sputtering chamber. A metal film, such as a titanium film is in situ deposited on the silicon

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substrate in the same sputtering chamber, so that the wafer throughput is improved. However, claim 4 of US-6,254,739 B1 does not require *in situ* "forming a titanium layer on the amorphized substrate surface".

For at the foregoing reason, claim 1 patently define over claim 4 of US-6,254,739 B1. Reconsideration and withdrawal of this rejection is respectfully requested.

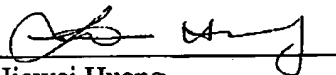
CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 1-2, 4-7, 9, and 11-13 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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